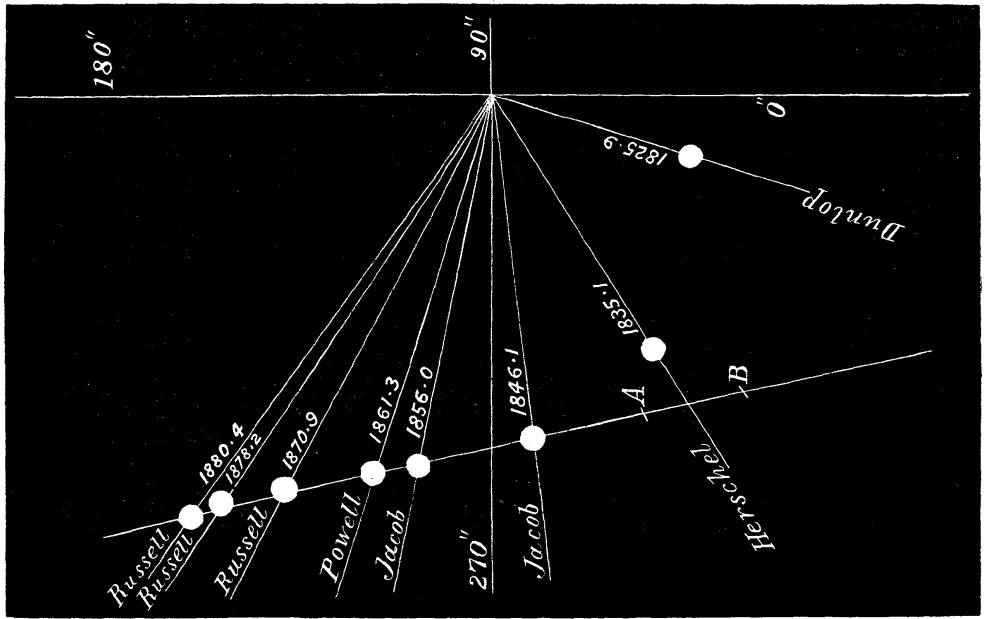


The agreement of the present parallax of  $0''.4676$  with that of  $0''.4654$ , found by the former series, is no doubt satisfactory. The accordance is indeed so close, that it is clearly to some extent due to the chapter of accidents. It would, however, seem that these investigations render it probable that the annual parallax of  $61\ Cygni$  is nearer the half-second found by Struve than the third of a second found by Bessel.

*Southern Double Stars.* By H. C. Russell, Esq., Director of the Sydney Observatory.

I have recently found that all my own observations of  $p\ Eridani$ , the interesting Southern double star, are better represented by a straight line than by the orbit which it has been supposed the companion star was moving in; and upon collecting other observations I found that as far back as 1846 the motion seems to have been in a straight line. Further, the motion in this line seems



by the observations to have been almost exactly at the same rate from 1846 to 1856 as from 1870 to 1880. If this rate of motion is carried back to Herschel's date we get a position marked A in the accompanying diagram, which shows the position  $p\ Eridani$  would have then occupied; if its motion is in a straight line this only involves the supposition of a small error in angle, and half a

second in distance, in Herschel's observations, quantities not impossible considering the moderate optical power at his command. With regard to Dunlop's position it appears, on reference to his notes, that he did not measure the distance; in fact, he only *estimated* it, and his telescope was so inferior that he may easily have made an error of half the amount. This seems the more probable from the fact that he made the angle of position  $16^{\circ} 54'$ , which does not accord with the subsequent measures by other observers. It does not seem, therefore, unreasonable to suppose that at his date *p Eridani* was at B in the diagram. Altogether the evidence is very much in favour of the supposition that  $p^1$  is simply  $p^2$  by reason of its proper motion.

If, however, Dunlop's observations must have full weight attached to it, then errors must exist in the work of other observers before the positions will fit into any orbit; and that of Jacob, *Monthly Notices*, vol. x. page 170, is much too small. In my own observations, made with a telescope of  $11\frac{1}{2}$  inches and power of 800, I do not think there can be any error sufficient to account for orbital motion.

An examination of meridian observations shows that in 1840 *p Eridani* was observed as one star at Madras, and the position given, R.A.  $1^{\text{h}} 33^{\text{m}} 43^{\text{s}}.91$  and N.P.D.  $147^{\circ} 0'' 29''.45$ , probably refers to the mean of the two stars. This N.P.D. brought up to 1875 agrees very well with that of  $p^2$  in the Cape observations, but  $p^1$  has increased in R.A., and in N.P.D. is  $3''.56$  greater; this agrees with the equatoreal measures, and goes to prove that  $p^1$  is moving.

I can detect little, if any, difference in magnitudes; if anything,  $p^1$  is the smaller. *Dunlop, Herschel, Jacob, and Powell* made the stars equal, and the Cape Catalogue is the first place I have seen a difference in magnitude noted.

The following recent measures of other southern doubles may be of interest.

Date of Observations.	Name of Star.	R.A.	Angle of Position.	Distance.	Power used.
		h m	° '	"	
1880.408	$\kappa$ Toucani	1 11	0 24	5.64	300
1880.446	$\gamma$ Centauri	12 34	181 16	1.39	800
1880.446	$\alpha$ Centauri	14 31	184 59	5.52	800
1880.446	$\pi$ Lupi	14 56	189 18	0.90	800
1880.457	H 5014	17 58	79 18	0.80	800
1880.457	$\gamma$ Coronæ Aust.	18 58	53 8	1.15	800

*p Eridani.*

Observer.	Epoch.	Mean Epoch.	Position.	Mean Position.	Distance.	Mean Dist.
Dunlop		1825.90		343.10		2.500
Herschel *	1834.85	1835.14	302.33	301.68	3.65	3.68
	1835.		302.30		3.65	
	1835.58		302.42		3.75	
Jacob	1845.87	1846.11	276.0	276.25	4.16	4.21
	1845.87		276.2		4.16	
	1845.88		275.8		—	
	1846.83		277.0		4.32	
Powell		1853.95		263.10		3.95
Jacob	1856.08	1856.03	262.11	259.68	4.92	4.62
	1856.09		260.06		4.63	
	1856.10		261.47		4.62	
	1857.90		257.18		4.38	
	1857.98		257.60		4.56	
	1858.02		258.93		4.55	
Powell		1861.34		253.37		4.86
Russell, Mean of 10 Obsvns.		1870.92		242.60		5.46
"	Power 800, { 1878.16	1878.19	236.34	237.00	6.029	6.138
	10 Obsvns. { 1878.22		237.26		6.147	
,, Power 800, 10 Obsvns.		1880.45		234.41		6.295

\* 180° has been added to angle.

Sydney Observatory,  
1880, June 17.